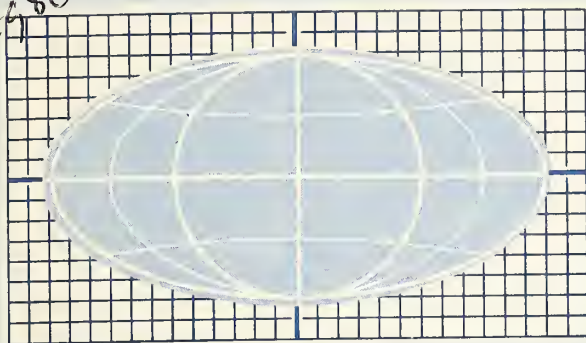


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THE BRAZILIAN AGRICULTURAL SITUATION: A LOOK AHEAD

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This report reviews in brief Projections of Supply and Demand for Agricultural Products of Brazil through 1975, a market development study conducted by the Getulio Vargas Foundation of Brazil under contract with the U. S. Department of Agriculture. ^{1/} The Foundation study is one of a series by the USDA to evaluate the long-term potential supply and demand for agricultural products throughout

the world. Data used as a basis for projections are from Brazilian sources and vary in many instances from USDA estimates, some of which are specifically noted. Hence, projected trends are probably of more significance than quantitative estimates. Study results expressed herein do not necessarily reflect the views of the U. S. Department of Agriculture.

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Brazil is the world's fifth largest country in area and the eighth largest in population. Its population, estimated at nearly 86 million in 1967, is about evenly distributed between rural and urban. Despite a significant expansion in minerals and manufacturing during the past two decades, the economy remains largely agricultural. Coffee, cotton, sugar,

and cocoa beans are the principal exports and sources of foreign exchange. Brazil is a major importer of agricultural products, taking over 40 percent of Latin America's wheat imports in 1967. It also ranks as the largest Latin American market for U. S. agricultural products.

^{1/} The complete study may be requested from the Division of Information, Office of Management Services, U. S. Department of Agriculture, Washington, D. C. 20250.

Brazil's large population and its agriculture are concentrated in the temperate and subtropical regions in the south and along the narrow coastal plains in the east-central and northeast regions. The western interior,

which comprises 3.3 million square miles, contains three-fourths of the area of Brazil. It is thinly populated and in many places even

unexplored. As roads are built into this vast wilderness, new lands are opening up for cultivation.

STUDY HIGHLIGHTS

The Foundation study shows that rapid population and income growth will continue to increase the import demand for some agricultural products; yet, farm production will be adequate to permit an increase in traditional exports through 1975.

Larger imports in 1975 are projected for wheat, potatoes, milk products, codfish, and olive oil (table 1). Increased exports are expected for rice, corn, cocoa beans, coffee beans, sugar, cotton, tobacco, yuca products, and bananas. Production and utilization should balance, with trade insignificant, for dry beans, oranges, beef, pork, mutton and goat meat, poultry meat, eggs, and lard and bacon.

The Foundation based these expectations on an analysis of the value and quantity of

domestic production and demand for selected agricultural commodities in Brazil which were projected through 1975. Brazil's population is expected to increase from 70.1 million in 1960 to 110.9 million in 1975--a compound annual increase of 3.1 percent. Real gross national income is projected to increase 6.2 percent annually between 1960 and 1975. Real per capita gross national income therefore should increase 3.1 percent a year (table 2).

Projected urban population increases much faster than the rural population, going from about 46 percent of the total population in 1960 to 57 percent in 1975. The urban share of the gross national income increases at twice the rate of the rural sector (table 2).

PROJECTED TRADE

Imports of wheat into Brazil in 1975 are estimated at 3.2 million metric tons (table 1). Exports of rough rice and corn are projected at 100,000 tons and 300,000 tons, respectively. Sugar, coffee beans, cocoa beans, cotton, and tobacco will also be available for export.

Trade projections are based on the differences between projected supply and projected demand. These differences are called the potential surplus (or deficit) or the effective surplus (or deficit), in accordance with the two concepts of projected demand developed in the study. The effective surplus, like the effective demand, is considered most likely to occur.

Brazil is expected to remain largely self-sufficient in agriculture. However, with some changes in Government policies, Brazil could become a major food exporter, the study asserts. If import restrictions were removed or price policies changed, Brazilians would consume more wheat, potatoes, beef, milk, and oranges and less rice, corn, yuca, bananas, and edible oils. Such a dietary change could release for export approximately 3.5 million tons of rough rice a year, along with 5.0 million tons of corn and 900,000 tons of oilseeds. Exports of yuca and bananas could also increase.

An analysis of potential U. S. trade or the probable U. S. share of Brazil's foreign

Table 1.--Production, consumption, and net trade of selected agricultural products, Brazil, 1960, with projections for 1975 ^{1/}

Agricultural products	1960			1975				
	Pro-	Con-	Net	Pro-	Consumption ^{2/}	Net trade ^{3/}		
	duction	sumption	trade ^{3/}	duction	Potential	Effective	Potential	Effective
	:	:	:	:	:	:	:	:
----- -1,000 metric tons -----								
Cereals, beans, roots and tubers:								
Rice, rough.	4,600	4,560	+ 40	11,420	7,900	11,320	+3,520	+100
Corn	8,490	8,350	+140	18,990	14,040	18,670	+4,950	+320
Wheat	630	2,650	-2,020	980	5,170	4,190	-4,190	-3,210
Dry beans.	2,160	2,160	0	3,290	3,290	3,290	0	0
Potatoes.	1,240	1,270	-30	1,950	2,670	2,010	-720	-60
Yuca	17,500	17,370	+130	33,780	24,290	33,070	+9,490	+710
Meat and livestock products:								
Beef	1,640	1,610	+30	2,100	3,390	2,100	-1,290	0
Pork (excl. lard and bacon)	480	480	0	990	770	990	+220	0
Mutton and goat meat	162	162	0	180	220	180	-40	0
Milk (fresh milk equiv.)	6,520	6,600	-80	10,310	14,100	10,440	-3,790	-130
Poultry	280	280	0	540	540	540	0	0
Eggs	300	300	0	970	620	970	+350	0
Codfish	290	320	-30	910	670	1,000	+240	-90
Fruit:								
Bananas	3,230	2,950	+ 280	7,690	6,100	7,020	+ 1,590	+ 670
Oranges	2,320	2,200	+ 120	3,990	4,790	3,990	-800	0
Edible fats and oils:								
Lard and bacon ^{4/}	590	590	0	780	940	780	-160	0
Cottonseed ^{5/}	770	770	0	1,850	1,310	1,850	+540	0
Peanuts ^{5/}	155	155	0	580	440	580	+140	0
Corn oil	5	5	0	50	20	50	+30	0
Olive oil.	0	9	-9	0	14	14	-14	-14
Soybeans ^{5/}	90	90	0	510	390	510	+120	0
Copra	80	80	0	260	190	260	+70	0
Other:								
Cocoa beans	160	8	+ 152	220	20	20	+ 200	+200
Coffee beans ^{6/}	2,080	510	+ 920	2,040	870	870	+1,170	+1,170
Sugar, centrifugal	3,200	2,570	+ 630	5,090	5,090	4,090	0	+ 1,000
Cotton	537	397	+ 140	1,305	910	910	+440	+ 440
Tobacco	160	125	+ 35	380	220	220	+160	+160

^{1/} Basic data are from Brazilian sources which differ from USDA estimates in many instances. Consumption is total utilization. Production is a constant; consumption, a variable; and trade, a residual. ^{2/} Potential consumption is theoretical demand based solely on population, income, and income elasticity considerations. Effective consumption is most likely demand adjusted for expected substitution due to policy and supply considerations.

^{3/} Plus (+) indicates exports and minus (-) indicates imports. ^{4/} Product weight. ^{5/} Includes estimated production for edible oil processing for domestic demand only, accounting for approximately 73 percent of cottonseed production, 34 percent of peanut production, and 41 percent of soybean production output in 1960. ^{6/} Stock changes are excluded from consumption data. Source: Getulio Vargas Foundation. Projections of Supply and Demand for Agricultural Products of Brazil through 1975. Brazilian Institute of Economics, 1968, tables 74 and 77.

Table 2.--Gross national income and population, Brazil, 1960, projections for 1975, and compound annual rate of growth, 1960-75

Income and population	:	:	:	Compound annual rate of growth
	:	1960	:	1975
	:		:	1960-75
	:		:	
	:	<u>Billion 1953 cruzeiros</u>	:	<u>Percent</u>
Gross national income:	:			
Rural.	:	147.5	:	247.6
Urban	:	<u>400.5</u>	:	<u>1,113.1</u>
Total	:	548.0	:	1,360.7
	:		:	
	:	<u>Million persons</u>	:	
Population:	:			
Rural.	:	37.6	:	48.0
Urban	:	<u>32.5</u>	:	<u>62.9</u>
Total	:	70.1	:	110.9

Source: Projections of Supply and Demand for Agricultural Products of Brazil through 1975, tables 14 and 21.

trade was not part of the study. However, by 1975, the study indicates, Brazil's agricultural imports will be minimal, except for wheat and dairy products, both of which are imported in substantial quantities from the United States. During the 5-year base period (1958-62), the United States supplied 88 percent of the dried milk and 46 percent of the wheat shipped to Brazil. This percentage of imports from the United States increased slightly from 1962-66. If the United States can maintain the same share of the market it held for the 1958-62 base period, U. S. wheat exports to Brazil will approximate 1.5 millions tons in 1975. Likewise, U. S. milk exports to Brazil in 1975 should approach

115,000 tons (fresh milk equivalent) or over 10,250 tons (nonfat dried milk basis). Aid donations are expected to continue as the major source of Brazilian milk imports.

Although Brazil is a significant importer of apples and pears, the Foundation did not include these fruits in its analyses. (USDA projections indicate that imports of apples and pears into Brazil are likely to increase.)

Projected Brazilian exports of corn, rice, and oilseeds show an increased potential for competition with U. S. exports. (Other reports indicate these projections may prove conservative.)

PROJECTED DEMAND

Two projections of demand--potential and effective--were made as part of the study.

Potential demand was based on projected population and income growth using quantity

income elasticities and assuming constant 1960 relative prices. The elasticities were computed from income and consumption expenditure data produced by family budget surveys. Potential demand reflects consumer tastes at the projected income and population levels and implies no change in relative prices.

Projected effective demand was based on the continuation of past trends in prices, production, and trade policies and reflects the same trends and conditions as projected domestic production. Projected effective demand considers past consumption trends and expected Government trade policies and implies changes in relative prices and/or some form of restriction on domestic demand.

The study assumes effective demand is a more accurate indicator of future require-

ments than potential demand. This is probably a safe assumption except where domestic policies may be altered to offset imbalances in production and consumption.

The derived income elasticities were positive for all study commodities, except for corn, dry beans, yuca, lard, and mutton and goat meat (table 3). Elasticities were also relatively low for rice, pork, bacon, coffee, and sugar. The projected effective demand was lower than the potential demand for many of the commodities with higher income elasticities, largely because of assumed supply limitations. Commodities with lower elasticities were used as substitutes. The projected effective demand was greatest for edible vegetable oils and oilseeds, rice, wheat, pork, eggs, codfish, bananas, cocoa beans, and cotton (table 4).

PROJECTED SUPPLY

Supply projections were based largely on time series production trends. These trends were modified slightly by the results of farm surveys and derived production functions. The adjusted time series projections were aggregated using price weights and were compared with projected aggregate production based on a national model. The national model used the results derived from the farm surveys and considered alternative probable input levels and the resulting output. Since the projections of the aggregate time series and the national model projections were relatively close, the individual commodity projections based on time series were used in the study.

The greatest increases in production were projected for the edible vegetable oils and oilseeds, rice, corn, yuca, pork, poultry, eggs, bananas, cotton, and tobacco (table 4). Increases at rates less than population growth were projected for dry beans, cocoa beans, beef, mutton and goat meat, lard and bacon. Coffee bean production is expected to show a slight decrease by 1975.

Study data on oilseed production apparently accounted only for oilseeds processed into oil for domestic use. The rapid increase in overall oilseed production which has occurred in recent years was not foreseen in the study projections.

SOME STUDY IMPLICATIONS

Projected balances of consumption and production indicate Brazil has a real potential

for remaining relatively self-sufficient in agricultural production. Given available re-

Table 3.--Income elasticities for selected commodities determined by family budget surveys, Brazil, 1960, and projections for 1975 1/

Commodity	Elasticity coefficient	
	1960	1975
Rice.	0.16	0.23
Corn	-0.28	-0.55
Wheat.	0.38	0.50
Dry beans.	-0.07	-0.12
Potatoes.	0.50	0.61
Yuca	-0.20	-0.35
Beef.	0.55	0.66
Pork	0.04	0.06
Mutton and goat meat	-0.22	-0.40
Milk.	0.58	0.69
Poultry.	0.34	0.45
Eggs	0.53	0.64
Fish.	0.56	0.67
Processed meats	1.11	1.07
Bananas	0.25	0.35
Oranges	0.63	0.73
Lard	0.00	-0.01
Bacon.	0.05	0.09
Vegetable oils	0.72	0.80
Cocoa and cocoa products	2.05	1.44
Coffee	0.12	0.18
Sugar	0.05	0.08

1/ Direct consumption only.

Source: Projections of Supply and Demand for Agricultural Products of Brazil through 1975, table 33.

sources and the results of this study, the Brazilian Government may initiate policies to increase the country's self-sufficiency. If production of deficit commodities can be stepped up, then those in surplus can be made available for export. For example, if more wheat is grown, rice can be marketed abroad; if enough animal fats or oilseeds are produced

to satisfy domestic requirements, oilseeds can be exported.

Since study results indicate rather sizable deficits in beef and milk production, the Brazilian Government may implement policies designed to overcome these deficiencies. Increased use of improved forages and limited

Table 4.--Projected compound annual rates of growth for potential and effective consumption and production, selected commodities, Brazil, 1960-75

Commodity	Consumption		Production
	Potential	Effective	
	----- Percent -----		
Cereals, beans, roots and tubers:			
Rice, rough.	3.7	6.2	6.2
Corn	3.5	5.5	5.5
Wheat	4.6	3.1	3.0
Dry beans.	2.8	2.8	2.8
Potatoes.	5.1	3.1	3.1
Yuca	2.3	4.4	4.5
Meat and livestock products:			
Beef	5.1	1.8	1.7
Pork (excl. lard and bacon)	3.2	4.9	4.9
Mutton and goat meat	2.1	0.7	0.7
Milk (fresh milk equivalent).	5.2	3.1	3.1
Poultry	4.5	4.5	4.5
Eggs	5.0	8.1	8.1
Codfish	5.0	7.9	7.9
Fruit:			
Bananas	5.0	5.9	5.9
Oranges	5.3	4.0	3.6
Edible fats and oils:			
Lard and bacon	3.2	1.9	1.9
Cottonseed	3.6	6.0	6.0
Peanuts	7.2	9.2	9.2
Corn oil	9.7	16.6	16.6
Olive oil	3.0	3.0	0.0
Soybeans	10.2	12.3	12.3
Copra	5.9	8.2	8.2
Export products:			
Cocoa beans	6.3	6.3	2.1
Coffee beans	3.6	3.6	-0.5
Sugar, centrifugal	4.7	3.1	3.1
Cotton	5.7	5.7	6.1
Tobacco	3.8	3.8	5.9

Source: Computed from table 2.

OFFICIAL BUSINESS

use of corn for cattle feed can be expected if price ratios are favorable. As more beef and milk become available, less corn, rice, and yuca will be consumed by humans. Thus, export availabilities of these crops may be increased unless offset by use as feed.

In general, the study will probably be most useful as a background for formulating future agricultural policies. It should be noted, however, that aggregate national projections for an area as large and complex as Brazil do not always present the full picture. Projected balances for some commodities may not actually occur in the quantities indicated because of projection feedbacks in the form of policy changes. Furthermore, regional

imbalances and resulting trade potentials can occur even when national averages indicate no imbalance or trade potential exists. "Pocket" markets will continue to develop periodically, and the U. S. business community needs to remain alert to this potential.

Although some data on a regional basis are contained in the Foundation study, a supplemental study is underway to delineate further the regional differences in demand. This additional information will provide assistance in evaluating the national averages presented in the original study report and in other Economic Research Service publications dealing with market development and food consumption levels.